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Bulletin to the Schools

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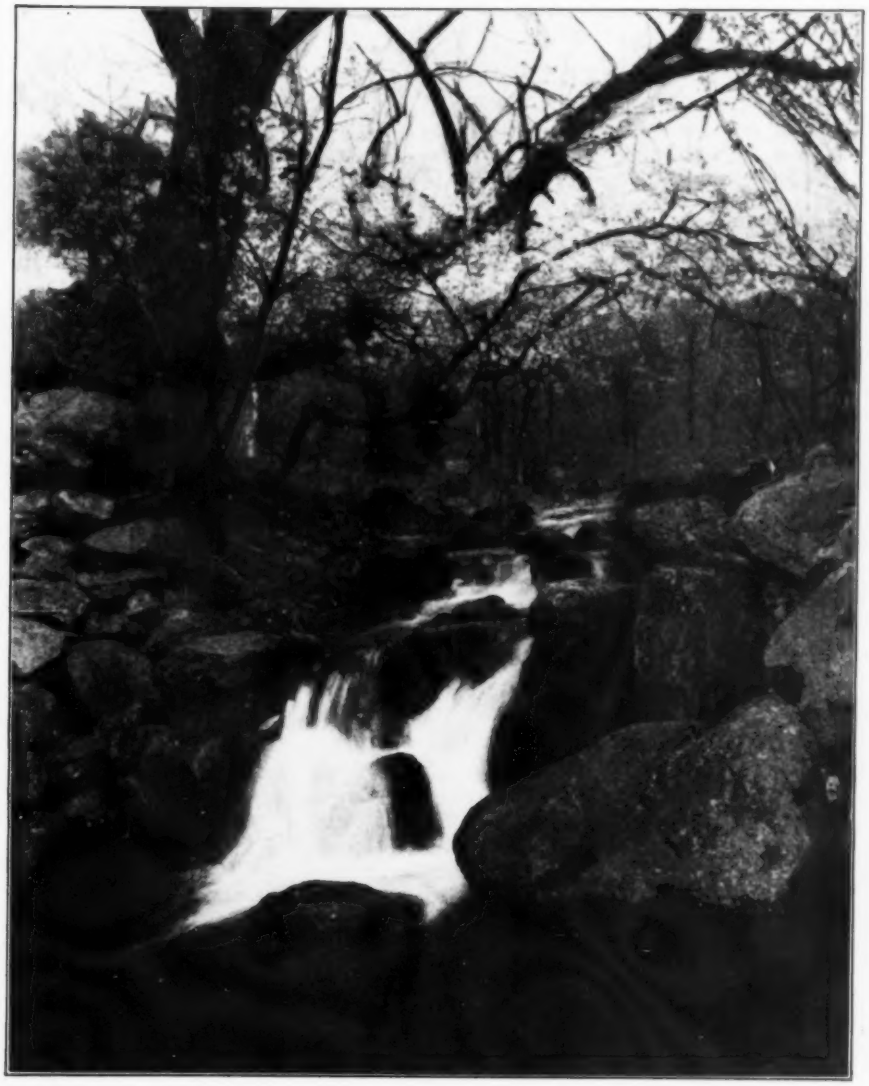
Arbor Day Number



Wilderness Society Creed

TODAY'S progressive view of nature conceives the American people using and enjoying it for the needs of everyday living, for pleasuring, and as an inspiration for happiness and achievement; but it specially conceives it necessary to save those parts of our slender remaining roadless areas which are worth more for study, relaxation and the wilderness type of recreation than for picnicking, motoring and commercial activities; also it believes that remaining primeval areas which are museums of creation, often also remarkable for scenic grandeur and extraordinary natural beauty, should be carefully protected, undisturbed, for observation, scientific study, and appropriate types only for enjoyment.

Every type of human use should be assigned its ample quota of appropriate area while there is area still available for all uses, and no areas should be seized for the irrevocable benefit of any one type of use, no matter how popular such use may be at the time, until all types have been fully and fairly considered for it with all the evidence presented. And before final decision is made, consideration should be given the fact that primitive areas are easily destroyed; but, while primitive conditions may develop again in from six hundred to a thousand years, the broken continuity will never be restored.

The inherent rights of succeeding generations to study, enjoy and use fine examples of primeval America is a responsibility of this generation.

ROBERT STERLING YARD

When I Was a Boy — And Now

WALTER PRICHARD EATON, UNIVERSITY THEATER, NEW HAVEN, CONN.

When I was a boy I lived near a large meadow, almost a mile long, which was surrounded by pine woods. Two brooks ran through this meadow, and in the fall they were dammed up, converting the entire meadow into a beautiful shallow pond. In the spring the water was let out to run a small sawmill for a few weeks. The result was that all winter we had fine skating on a pond which froze early because it was shallow and still, and froze smooth because the pines kept off the wind. The whole town had room to skate on it — men, women and children.

We reached the pond by walking through the quiet woods, and when we got there somebody made a fire on the shore, in an open place where it could do no harm, and we all sat around it on old logs, put on our skates and warmed our hands. We would skate back to it when we became cold, or to dry our legs if we broke through the ice. At night we would build it high, and I can still remember its red glow shining out over the black ice, and the shadows dancing in the dark pines behind it. Always the pines. Even when I was playing hockey, I never quite forgot the pines, and often another boy and I would skate up the frozen brook deep into the woods, and then just stand still and listen to the soft sound of them overhead, like sea surf heard in a dream. At night, after we took off our skates by the fire, threw water on the embers, and started home through the black forest, our feet (which felt very light and funny with our skates off) could tell where the path was. We did not need to see. The instant we stepped off it, the untrodden soft carpet of needles warned us.

One year, in the 1890's, my father and a few other men, fearing that all these pines would be cut down, secured an option on them for about $10,000, and asked the citizens, in town meeting, to buy them for a town park, thus saving the woods and the skating.

The town meeting laughed. "What," said they, "spend $10,000 for some pine trees and a place to skate? Why, there are woods enough in this town for everybody, free, and there'll always be skating."

So the town did not buy, and as my father and his friends were too poor to do it themselves, the option lapsed. And what happened?

Yes, you have guessed. Inside of 20 years, the pines were all cut down. Small house lots were laid out amid the stumps. A good bit of the meadow was filled in with ashes and rubbish, and shacks were stuck in there. The brooks dried up — a perfect illustration of how deforesting an area affects the water supply. There were no more beautiful pine woods for the children of that town to walk in. There was no smooth, safe pond for them to skate on. There was only a shanty settlement.

And about 1916 this same town had to pay nearly $20,000 for a miserable 20 acres or so of scrub meadow, without a tree on it, for a public playground. One little corner is flooded artificially in winter, to make a spot to skate. And for half the sum, this town could have had 300 or 400 acres of woodland, and a pond almost a mile long, for the enjoyment of all its citizens forever!

You think that is pretty short-sighted, don't you? But the same sort of thing has happened in hundreds of towns in America, and is still happening. The time to save your woods and your brooks and your picnic grounds and your skating is when you have them to save. And the towns today which still have them are, of course, the smaller country towns. If you live in a small town, if you go to a country school, you can probably strike a bigger and better blow for conservation than the boy or girl in a city. There are woods left in your town, and brooks left, and you can help save some of them.

I like to see children planting trees on Arbor Day. I like to see anybody planting trees on any day when it is a proper time for planting. The more the better. But if every school boy and girl in New York State planted a tree this Arbor Day, there would still be fewer trees planted than are already growing in the woods around your country town. If every small town in New York set aside 100 acres of woodland for a town forest, or town park, think of the millions of trees already growing which would be saved! Think of the chance you have to urge this, first in school, then to your parents and neighbors, and finally, when you have a vote, in the town councils!

If you love the woods — and what boy doesn't? — if you love brooks with water in

them, and ponds to skate on and swim in; if you enjoy ski trails where the snow lies smooth, and mountain sides which are green, not bare and eroded; if you realize, as you must, that a land without trees becomes a desert and hills without forest cover are the start of every flood; if you know that forests are absolutely essential to a prosperous country — then you will realize that Arbor Day means much more than setting out a sugar maple in the school yard. Then you will realize that it means focusing the attention of everybody on the great importance of trees; and you will see where your part comes in.

Your part is to preach the gospel of trees and forests to all your mates until you are 21, and after that to vote, with your mates, to save the woods and wilderness. If all the school children of New York today get to believe this gospel, and vote for it when they come of age, the men who want to strip all our woods to the bare ground, instead of lumbering them properly, and the men who think it is silly to have a town forest for the boys and girls to wander in, and clean, full brooks for them to wade and fish in, are due for a big surprise about 1948!

Let's make it sooner if we can.

Planning for Natural Wild Life Conditions in State Parks

HERBERT M. BLANCHE, LANDSCAPE ARCHITECT AND SUPERINTENDENT, FINGER LAKES STATE PARKS COMMISSION

The presence of abundant wild life in state parks and other public areas of a similar character is of important recreational value. Our native animals and birds should be part of our lives, and to see them in their natural beautiful surroundings is a thrill that can be recaptured in memory. The camera is rapidly taking the place of the gun in the hands of nature lovers, providing a permanent record of pleasant days in the open.

State parks are generally situated in attractive, and often strikingly beautiful localities, not immediately adjacent to large towns, and usually are of considerable extent. Thus conditions for abundant wild life are exceptionally favorable. In planning the development of each park care must be exercised to provide areas where bird and animal life can be encouraged and protected.

In the nine state parks controlled by the Finger Lakes State Parks Commission we have beautiful scenery and varied conditions favorable to wild life. In planning these parks, however, provision must be made for recreation of a character calling for intensive development of certain areas, where swimming, ball games, picnicking, camping, skiing, skating etc. result in large and sometimes noisy crowds. Roads and parking areas are necessary to give access to these facilities, and together with the resultant intensive use, create conditions unfavorable to most wild life. Therefore, the park plan must, so far as possible, localize these busy spots. Fortunately maintenance is simpler and less expensive when busy areas are kept in a comparatively small section. Undisturbed hillsides and stream channels can be maintained where the lover of nature can enjoy his quiet recreation. Not easily accessible by roadway, these retreats may be developed as beauty spots with abundant wild life.

In selecting these refuges certain requirements must be considered. Unbroken dense woodland is not desirable from a wild life viewpoint, but groups of mature trees provide homes for some species. Dead and fallen trees must not be destroyed, unless they create a fire danger, since hollows are necessary to some mammals and birds. To "clean up" woodland may be very destructive from the viewpoint of the conservationist. Varied topography is desirable, since broken country provides conditions suitable to a wider range of wild life than flat lands. Springs, ponds, swamps and small streams are advantageous, since water assures the presence of species that need moist conditions. Some open areas should be present, as many species haunt sunny spots, and our native wild flowers and "weeds" growing there provide seeds that attract them. In the edges of open areas shrub masses give cover and fruits for food. If an area as described is available a sanctuary is in the making.

Photograph by Herbert M. Blancke

Deer on Ledge at Watkins Glen State Park

"No Hunting or Trapping" is the rule in all state parks and this requirement is strictly enforced. Fishing is in general encouraged, and park streams are stocked with fish. Fishermen are often lovers of nature, and can enjoy sport with an appreciative eye for the birds and beasts around them. The entire park should be a haven. The three requirements are cover, food and protection and much can be done in the selected areas to provide them. It is interesting to note how "wild" creatures become less shy when not

Photograph by A. A. Allen

The Duck Hawk of Taughannock

hunted. In the park at Enfield Glen six deer followed a tractor back and forth all one winter morning, curiosity widening their dark eyes.

About 80 acres in one of our Finger Lakes Parks may serve as an illustration of desirable treatment to increase its beauty and recreational value. The area when acquired consisted of sharply rolling old pastures, bounded by a large ravine on the south with two small streams in ravines traversing it, and containing a marsh and some old woodland in the boundaries. For cover, the ridge tops and slopes were planted irregularly with pines, densely in spots, and interplanted elsewhere with deciduous trees, such as oaks and maples, thus adding to beauty and providing some food. Lower on the slopes and bordering the tree groups, small trees and shrubs that are attractive and bearers of berries and fruits are being massed. Flowering dogwood, thorns and many others are beautiful and productive. Winding hollows throughout the area are to be kept open of massed trees and shrub growth, wild flowers and other herbaceous plants providing seeds. The entire area will be attractive, and the broad open glades give easy access to visitors, although no definite trails are being built.

Food supply should be a natural product of the area, but until the supply of seeds, nuts and fruits can be developed, strips of grain are sown and allowed to stand uncut. Such trees as the walnut, hickory, oak, mulberry, pine and hemlock provide food.

Small trees providing food such as thorns, flowering dogwood and seedling apples may be grouped in a natural way with shrub masses to add beauty. Many shrubs are valuable, such as viburnums, dogwoods, blueberries, huckleberries, sumachs etc. Planting shrubs in groups and masses calls for large numbers, and is expensive, but a system of ploughing irregular

strips, scattering seeds of desirable shrubs, then harrowing them in, promises well, but is yet in the experimental stage. In a swamp, channels and pools have been created by excavation, thus encouraging water-loving and nesting birds. This program when complete will provide the cover and food necessary, and beauty will add to wildlife interest.

Protection must be continuous and complete, and signs on the boundaries prohibiting hunting and trapping must be supported by vigorous enforcement. A balance of nature is desirable and so-called "predators" should not be destroyed except under very exceptional circumstances as they are part of the native fauna. Hunting dogs and cats must be kept out. During dry periods especially, care must be exercised to prevent fires.

An area such as described may take years to develop but will amply reward effort by the increase of wild life, for a state park is not complete without an abundance of birds and animals.

Trees Record Their Histories

MRS J. A. COMMON, WATERTOWN

Trees have their hopes, their disappointments, their struggles. They can not talk to us about them, but we can read easily enough in their written record the story of their accomplishments and their failures.

Young and crowded together in a thicket — mere underbrush to the human — they jostle and crowd and push each other, reaching out and up until some conquer others and rise supreme above them, the survival of the fittest.

Rubbing branches with their neighbors they strive for supremacy. Sometimes one of a contending pair finally wins and sometimes both continue to grow wrapped in each other's embrace, a maple and an elm with their boles so compacted as to appear to be a single trunk.

A tree can not hide the years of its age, for the record is written in the scars of its bud scales. Every branch is a year younger than the stem which bears it. Every branch finishes the year by forming a bud. In the spring this bud casts off the winter coverlet of scales and a permanent record is made by the scars where they fastened. The age of a tree can be estimated by counting the branches and branchlets along one line of growth from root to tip. Of course the stump when cut shows the age very clearly in the rings of growth.

Stumps and their concentric rings tell us many things, of struggles and accidents, of years of vigor and years of sickness, of years of plenty and years of drought; and these tally accurately with the weather records of the same periods.

Trees care for their cuts and bruises and broken limbs. They even prune themselves when necessary. A branch dies, overshadowed perhaps and so deprived of sunlight and air, or possibly it was impaired by frost or had been mutilated by a borer beetle. Whatever the reason for its death, it did not cause it to fall. The tree goes about righting such a matter methodically, for such a thing must not be neglected. A dead branch will rot and rotten wood will eat into the heart of the trunk and impair it. Therefore the branch must be disposed of. To do this the tree grows a collar of new wood about the base of the dead branch. Tighter and tighter the collar grows pushing aside the old wood and ultimately choking it off. Soon beaten by winds or weighted down by snows the branch falls and the collar closes over the wound. When the tree is finally cut all the record of these struggles will be found written in the wood, and they help to make the irregularities which add so much to the beauty of the grain.

The diary of the tree is written in a language understood by those who would learn and is as lasting as the wood itself.

The University of the State of New York

Bulletin to the Schools

Issued semimonthly during the school year by the State Education Department

CHARLES F. PROBES, *Editor*

This bulletin is sent without charge to all schools and educational institutions of the State. To others it will be mailed postpaid for 50 cents a year, 5 cents for single copies.

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APRIL 1, 1938

Arbor Day Proclamation

Most happy are we people of New York in our heritage of natural resources! With the approach of spring, Nature smiles in our waysides and meadows, and the woods beckon us to pastime and recreation. Our landscapes abound in shrubs and trees, and forests clothe our hills and vales. That we may preserve these natural beauties and retain their increasing value for ourselves and posterity, it becomes both our pleasure and moral obligation at this season of the year to plant trees. Let us, then, cultivate a love for trees, treasure them throughout our lives, and hand them down to succeeding generations as an inexhaustible legacy.

"What do we plant when we plant the tree?
A thousand things that we daily see.
We plant the spire that out-towers the crag,
We plant the staff for our country's flag,
We plant the shade from the hot sun free:
We plant all these when we plant the tree."

—*Henry Abbey*

As required by the law of the State and in accordance with deep convictions and congenial duty, each year the Commissioner of Education fixes the time for the observation of Arbor Day. Therefore April 22d, April 29th, and May 6th are herewith designated as Arbor Day, and with local authorities is placed the responsibility to determine which date will best serve each community, and to conduct such programs as are agreeable and fitting.

FRANK P. GRAVES
Commissioner of Education

Allegany School Will Open Its Twelfth Season

The Allegany School of Natural History in Allegany State Park will begin its twelfth season on July 3d. The session will continue for seven weeks, through August 20th.

"The School in the Forest," as it is popularly called, is within 90 miles of Buffalo. Dr Robert B. Gordon, who is assistant professor of botany at Ohio State University, is director.

More courses are listed in the 1938 announcement than have been offered any previous season, according to Doctor Gordon. Both college credit and noncredit courses are included. The list follows: field zoology, entomology and research in zoology, by Dr Albert R. Shadle, professor of biology and head of the biology department, University of Buffalo; natural history of birds and wild life conservation, by Aretas A. Saunders, biology instructor, Bridgeport Central High School, Bridgeport, Conn.; field methods in nature study and geology, by Professor William P. Alexander, Hayes professor of natural science and assistant curator of education, Buffalo Society of Natural Sciences; field botany and plant ecology, by Doctor Gordon; field ethnology by Dr William N. Fenton, instructor in social studies, St Lawrence University; and microscope technic, with Dr Oscar W. Richards, research biologist, Spencer Lens Company, as instructor.

The school is conducted by the Buffalo Society of Natural Sciences in cooperation with the University of Buffalo and Allegany State Park Commission. Under a cooperative arrangement, in operation for the first time this year, between the society and the university, the courses for college credit are a part of the regular offering of the university summer session. Instructors are members of the university summer session staff, and the courses are, consequently, university courses. A maximum of six semester hours of college credit may be earned during the summer.

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Acknowledgment

Assistance in the preparation of this Arbor Day number of the Bulletin to the schools was given by the New York State Museum. The Editor desires to express his appreciation to Dr Charles C. Adams, Director of the Museum; to Dr Homer D. House, State Botanist; and to the contributors of the articles.

Tree Collections Distributed to High Schools

GURTH WHIPPLE, NEW YORK STATE COLLEGE OF FORESTRY, SYRACUSE UNIVERSITY

In the fall of each year young forest trees are taken from the nursery of the New York State College of Forestry at Syracuse, N. Y., and supplied to the high schools of the State. These trees are sent out in sets of 15 species. They are securely packed in a bundle and accompanied by parafined pasteboard box containers. Complete information as to the type of trees, their habits and history, accompany each set. A few broad-leaved (hardwood) trees are in the collection; the rest are conifers (evergreens).

When the trees arrive the containers should be filled with dirt and one tree planted in each box. The schools use the trees for instructional purposes, chiefly in connection with biology, agriculture, art and general science subjects. If the trees are properly kept they may be removed from the boxes and planted in the ground in the spring.

In some schools the pupils are responsible for keeping the trees alive. They should be watered two or three times a week. Too much water, however, causes the paper boxes to weaken. They should not be placed over a radiator but it is not possible to avoid this in many cases as nearly every window sill in a school has a radiator under it. The trees suffer most at Christmas and Easter vacations. A pupil should be assigned to take care of the trees during those periods.

These small trees have been planted by some of the schools. Unless the trees are planted in protected places they may be stepped on by pupils or otherwise disturbed and destroyed. If properly planted, in five or six years the trees may be removed and transplanted to another site if that seems desirable. Planting the trees in a permanent or temporary site might fit in with the Arbor Day exercises. This has been done in some schools. For example, the Harriman Union Free School planted the first set of trees received after they had served their purpose in the classroom. Today these trees are three to five feet in height.

This project has been carried on for four years and seems to have been quite satisfactory to the schools. Pupils obtain considerable information about the different species and learn how to identify them. In the past these tree sets have been sent out by the New York State College of Forestry without charge. Hereafter the schools will be expected to pay express charges or in cases where there is no express office, the parcel post charges. In either case the cost will probably not exceed 20 or 25 cents.

One of the Tree Collections Sent to Schools by the New York State College of Forestry

School Children Planting Trees by the Rope and Whistle Method
The rope makes rows straight and the use of a whistle keeps the planters working together.

When interest is created in one tree the door is opened to the development of an interest in all trees and eventually in the forest itself. The importance of the forest can not be overestimated. It is therefore a part of the responsibilities of good citizenship to increase knowledge concerning this great natural resource. The essential rôle the forest plays in flood control, erosion of the soil, health and recreation, wild life and the supply of material from which at least 4000 different products are manufactured should be thoroughly understood.

It was the hope of the founder of Arbor Day, J. Sterling Morton, that through Arbor Day he might partly reestablish the forest empire which once held dominion over this country. The realization of that hope has begun, but much remains to be done. Significant events are rapidly transpiring which have a direct bearing on the future of the American forests. The Federal Government and the various state governments are passing new laws, new regulations and developing new projects relative to forest conservation in which each citizen has an interest. Arbor Day is one of the most successful efforts ever made in the United States to create forest conservation-mindedness in the youth of the Nation, the men and women of tomorrow.

Arbor Day should be a tree planting day. Tree planting is a natural human activity because of the almost kindred nature of tree and man and the dependence of man upon trees. The influence of Arbor Day over the community spirit has been altogether beneficial. It has been reflected in civic and social betterment and higher regard for the country in which we live. Whether Arbor Day has been devoted to the planting of ornamental trees, the beautification of highways, the establishment of memorial groves or the reforestation of idle land, a greater appreciation of the beauty and value of trees has been inspired.

With the vanishing of our virgin forests, the importance of Arbor Day has grown because the people have had opportunity to observe the impoverishment that follows forest denudation. Thousands have suffered great losses by the exposure of vast areas of land to sunlight and the elements through the unwarranted removal of the forests. Erosion by water and wind, floods, dry streams, scarcity of water supply for city and farm, the disappearance of fish

and game, timber scarcity and forest fires have taught a lesson which if not recognized bodes ill to the welfare of the Nation.

The spirit of Arbor Day rules out the devastation of forest land by wasteful logging operations and widespread forest fires. Setting a forest fire through carelessness and helping oneself to trees and wild flowers which grow on another person's property is nothing short of an enemy act against private and public interest.

The planting of trees by school children is effective in the development of better citizenship, in the creation of respect for property, law and order, because trees teach rationalism, order and forthright character. Boys and girls are finding out that trees through their century-long life are invaluable, loyal friends. In the whole out-of-doors of living things, trees probably are the most serviceable to mankind. For these reasons the New York State College of Forestry has felt the expense and labor in growing and distributing sets of young forest trees to the high schools of the State is a worth while educational endeavor.

The Best Implements for Planting Trees

Trees should be kept in a pail in three inches of mud to prevent the small delicate roots from drying.

Linnaeus, the First Modern Botanist

HAROLD ST JOHN, PROFESSOR OF BOTANY, UNIVERSITY OF HAWAII, HONOLULU

It is no uncommon thing for those not familiar with the science of botany to ask why "L.", or "Linn." follows the scientific name of so many of our American plants. More than 60 of the names of best known trees in New York State are thus credited to Linnaeus, while the number of shrubs and other plants the names of which also are credited to him, is several times larger. Who was Linnaeus and why are so many of these plant names credited to him?

Carl Linnaeus was born at Rashult, Sweden, on May 23, 1707. His father, a pastor, and his mother both loved flowers and the beauties of nature. His father planted and developed a fine garden at the parsonage and, of course, took the child into the garden, Even before he could walk, they would put a flower in his hand, and he would then sit with it quiet and happy.

Education for the boy was difficult to finance. The parents were in humble circumstances, yet they sent their eldest son through the primary and secondary schools. Carl made a satisfactory record, but did not excel or show aptitude in theology and the classical studies leading toward the clergy. Instead his natural interest and enthusiasm led him to the fields and woods. He made a herbarium and began to thumb the pages of the old herbals.

With small funds from his father he began his university training for the medical profession. The first year was spent at the University of Lund, where a single professor taught medicine and the sciences. Then he transferred to the University of Upsala, expecting better instruction. The medical faculty there consisted of two professors, both aged, tired of teaching and discouraged by the lack of facilities and funds. Both devoted themselves to their private investigations and writings and neglected teaching. During the year one gave a few lectures on birds, and two on plants after Linnaeus had left town. The other professor gave one lecture on physiology and four on Aristotle. Such was the year's

Carl Linnaeus

formal instruction. In his whole student life, Linnaeus never heard a lecture on botany.

Yet Upsala did provide resources. The library was excellent. There was a botanic garden, but it was neglected and its mere 200 species were dwindling. By springtime his money was gone. His clothes were threadbare and he suffered from hunger. The dean, Olof Celsius, returning in April, found an unknown young student haunting the botanic garden and absorbed in writing descriptions of the plants. When questioned, his replies showed knowledge, interest and perhaps genius. Celsius led him to his fine home and soon took him into the family and gave him free board and lodging. Linnaeus had won similar favors at Lund. Throughout his life he continued to charm the learned and win the patronage of the noble and wealthy. He was granted scholarships. He gave public lectures on botany. He wrote botanical papers, including one on the "Marriage of Plants," which aroused much interest and comment. In the spring he was appointed temporary lecturer in botany, despite opposition on account of his youth. Throughout the spring and early summer he lectured in the botanic garden, attracting from 200 to 400 listeners, while the regular professors at their infrequent lectures seldom had 80 in their audiences.

Lapland, in the northern part of Sweden, was a remote, mysterious and little known land. In December 1731, Linnaeus applied to the Swedish Royal Society for a grant to finance him on an exploration of the natural history, ethnology and natural productions of Lapland. He gave a long list of the necessary qualifications of such an explorer. One was that he should be, "born a naturalist, not made, for it is remarkable how they differ when they come to practise." Four months later the Royal Society emptied its treasury and granted him 400 copper dalers (about $83) for the Lapland exploration. This was unprecedented, the giving of funds for an independent natural history survey.

In May Linnaeus set out on horseback. He followed the coast to the head of the Gulf of Bothnia, traversed dense evergreen forests, crossed rushing rivers, sought out and lived with the Lapps, studying them and their reindeer on the fells. He crossed the barrier of glaciers and mountains and visited the Norwegian coast. He investigated iron mines, mosses, poisonous plants. Anything in nature was observed and recorded. Warned of the end of the season by frost and cold, he returned by way of Finland to Upsala. His report to the Royal Society was sympathetically received, but not until his accounts were copied and recopied with outspoken praise in foreign newspapers did his colleagues begin to give him full recognition. Surely it was their own fellow countryman of whom the foreign journalists and scientists were talking.

Linnaeus fell in love with Sara Elizabeth Moraea, 18-year-old daughter of a prosperous physician. His attentions were well received, but he was told that if he wished to marry her he must obtain his medical degree and establish a practice. As the Swedish universities did not grant this degree, he must seek it in a foreign country. The girl gave him her own savings, but even so his funds were very small.

After a short stay in Germany, he arrived in Holland. The University of Harderwijk did not require long residence. Linnaeus came,

Old Botanic Garden in Upsala

registered, took his examinations, and within three weeks was graduated as a doctor of medicine. Journeying on to Leiden he soon met the rich Dr J. F. Gronovius who was astounded at the knowledge and insight into botany shown by the young Swede. In a manuscript, the "Systema Naturae" Linnaeus proposed a reorganization of natural history. Gronovius was delighted with it and paid for its publication immediately. Professor Herman Boerhaave, Georg Clifford, director of the Dutch East India Company, and Professor A. van Roijen became his patrons. The wealthy and the learned vied for the privilege of entertaining and supporting Linnaeus and paying for the publication of his books. In less than three years he printed a dozen books, many of them epoch-making.

When Linnaeus made a short visit to England, Professor J. J. Dillenius at first gave him a frigid reception but later he warmed to the visitor and when the traveler wished to depart he implored him to stay at Oxford and share his ample salary. In France he was elected to the Academy, and urged to become a French citizen and accept a pension. Instead he hastened back to Sweden, hoping to marry Sara. Her father again refused the penniless young man, but gave him one more chance. If he should become a successful medical practitioner in Stockholm, then he might claim his bride.

Settling in Stockholm, he hung out his M. D. sign. Idle hours and discouragement were his lot at first, but his charm and ability won friends and patients. At the end of three years he had a large private practice, was court physician, physician to the admiralty, government assayer, lecturer on mining and botany at the Mining College, and president of the Royal Academy. Then, at last, he married his fiancée Sara.

In 1741 he was chosen professor of medicine at Upsala, the position for which he longed. The following 37 years were glorious ones for Linnaeus. His teaching attracted students in large numbers from Sweden, and soon they came from Norway, Denmark and Finland, also from Germany, England, Holland, France, Switzerland, Italy, Russia, and even from

Africa and America. His personality was sympathetic and magnetic. He dwelt on both the theoretical and the practical, and his words seemed to open the book of nature. He spoke freely from a few notes instead of reading long wordy lectures. He described or explained the living things with understanding and with a lively skill.

The students who studied under the great teacher were inspired to carry on the work. Many became professors in other universities. Others became explorers, often backed or financed through the efforts of Linnaeus. Thus Ternström went to explore the East Indies, Kalm to North America, Hasselquist to Palestine, Adler to the East Indies, Torén to China, Löfling to Guiana, Rolander to Surinam, Forskal to Arabia, Solander to the South Sea Islands with Captain Cook, Thunberg to South Africa, Sparrman to New Zealand and South Africa, and Rothman to Barbary.

The botanic garden throve under Linnaeus, with new plant houses and the cultivation of 800 additional species.

His pen seemed never idle, for despite his teaching and administrative duties he wrote book after book. In botany he reorganized the whole science. The books by previous writers contained a maze of long confusing names and lacked any good system of classification. Linnaeus devised the sexual system, which grouped the plants on the number of their sexual parts, an easy and a practical system. He proposed that each kind of plant should be known by a scientific name of two parts, that of the genus, and of the species, as *Rosa carolina*. Under this system he renamed and described the 8000 known plants, and stimulated worldwide exploration for the discovery of new plants. His reorganization was so successful that his contemporaries quickly accepted it, and the botanists now take his work (of 1753) as the beginning of modern botany, and reject all previous work.

To me Linnaeus has always seemed a great and an appealing figure, so on a recent trip to Europe I made it a point to visit Upsala. On April 6, 1936, my wife and I were guided through the old botanic garden, low and flat with formal beds. At one end is a long, low museum and garden building, at the other the two and a half-story residence where Linnaeus lived. He became prosperous and bought a large farm in the country, at Hammarby, about seven miles away. In 1762 he built a fine home there, occupied successively by Linnaeus, his daughter, his granddaughter and his great-grandson. It is now the property of the nation, a memorial to the great naturalist. There are mementos of Linnaeus in Upsala at the Botanic Garden and its residence, at the University, and his grave is in the red brick Gothic cathedral, but best of all is Hammarby. One illustration shows the home of Linnaeus. The buildings on the wings are farm buildings and quarters for servants. The one on the right has a dirt and sod roof, very quaint with its dense crop of fruiting stonecrops, *Sedum* sp. The residence is the main building facing the garden. It is of dark brown wood, white-trimmed, and with a tile roof. Its lines are severe, but the design and proportions are pleasing.

On the ground floor are the weaving room, the dining room, the kitchen, and the long room or servant's room. On the second story are the son's bedroom with the bedstead in which Linnaeus died, also the daughters' bedroom, the drawing room, the wife's bedroom, Linnaeus' bedroom, and his parlor or study. The latter is on a front corner and looks out over the garden and toward the meadows and farm buildings.

Within are reminders of the man himself, the furniture and utensils he used, the table and his inkstand, and the walls he had papered with colored botanical plates from contemporary books. The visitor here can visualize Linnaeus, as his general appearance and kindly face are preserved by scores of portraits and statues. In this country home he lived with his family —wife, one son and three daughters. In the light and pleasant study he wrote his innumerable books. And here, too, he taught his students, for during the summers he gave his courses at Hammarby. The students came to him and lodged in the near-by farm houses. His days and nights must have been full to the limit, for his scientific output was tremendous. His writings are impressive in bulk, even though mostly written in a condensed style, without verbs, almost telegraphic in brevity. Many modern botanists use this style without realizing that they, too, are following the lead of Linnaeus.

We must not remember Linnaeus as a mere cataloger of specimens. He was an inspired naturalist, motivated by a passionate love of nature as revealed by her myriad species, whether puny or immense, commonplace or exquisite. As a youth he saw the shimmering

Gardens and Country Home of Linnaeus in Hammarby

cotton-grasses, *Eriophorum,* sway on the tundras of Lapland, and he saw the palms of the Indies in the hothouses of the Netherlands. We still use his catalogs and his Latin names, but his own students learned more than technical names from him. With romance and understanding he told them of the marriage of the plants, and of the courtship and family life of the birds. Two hundred students followed him on a field trip. On returning, tired from the 13-hour tramp, they could still give a rousing, "Long Live Linnaeus," and then a cheer for science.

The hill behind the house was bare in Linnaeus' time. Now its moss-covered rocks are shaded by a fine mixed forest, with both evergreen and deciduous species. On its summit Linnaeus built his private museum, a little, square, stone building, about 16 feet on a side. On the front is the door, on each other side a single, shuttered window. Here the professor held classes. Around the walls were the specimen cases. As one now inspects this tiny cubicle, it is difficult to realize the treasures it once held — plants, animals and minerals from all the known world. These preserved plants and animals became the type specimens of the thousands of species described by this first naturalist of our modern times. It is common knowledge that these collections were sold by Linnaeus' widow, after long seeking a purchaser, to the young Englishman, James Edward Smith. They are now well preserved and made accessible for study in the beautiful rooms of the Linnaean Society of London.

Outside the door of the museum is a little stone pulpit, where on fine days, it is said, Linnaeus used to lecture. To accommodate his students he lectured in the morning in Swedish, but before breakfast he had already given the same lectures in Latin for his foreign students who did not know Swedish. His summer days began at 4 o'clock in the morning.

Perhaps one's impressions are largely formed from within. In my case, I was sentimentally inclined that day. I could feel the presence of the great naturalist. The wind was cold and chilling. His house and his museum were unheated, but I could feel the presence of the great teacher and scientist whose work set the standards that we taxonomists all attempt to emulate.

T imber for lumber and fuel
R esidence for birds and animals
E ntrancing beauty
E njoyable shade
S afety from floods

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